

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 9201 (1987): Pumps for handling slurry [MED 20: Pumps]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard

(Reaffirmed 2003)

SPECIFICATION FOR PUMPS FOR HANDLING SLURRY

(First Revision)

1. Scope — Covers the technical requirements for centrifugal pumps for handling slurry of size not exceeding 6 mm enveloping circle.

2. Units, Terminology and Classification — Units, terminology and classification relating to pumps for handling slurry shall be as specified in IS : 5120-1977 'Technical requirements for rotodynamic special purpose pumps (first revision)'.

3. Characteristics of Slurry — Characteristics of typical slurries handled by these pumps depend upon the nature and concentration of solids present in the mixture and properties of the liquid carrier (usually water). Slurries with concentrations varying up to 70 percent of solids by mass may be pumped through pipelines.

4. Nomenclature — Nomenclature of the parts commonly used in pumps for slurry shall be as given in Fig. 1 and 2.

5. Materials of Construction

5.1 It is recognized that a number of materials of construction are available to meet the needs for pumps handling slurry. Typical construction for different parts is given in Fig. 1 and 2.

5.2 Gaskets, Seals and Packings — Gaskets, seals and packings used for pumps handling slurries shall conform to those specified in IS : 5120-1977.

5.3 The pump components, where necessary, shall be of abrasion resistant hard material or shall be rubber lined with good quality hard rubber (ebonite) having shore hardness of 70 to 79°. The rubber lining shall be done in accordance with IS : 4682 (Part 1)-1968 'Code of practice for lining of vessels and equipment for chemical processes: Part 1 Rubber lining'.

6. Direction of Rotation

6.1 The direction of rotation of pumps shall be designated clockwise or anti-clockwise as observed when looking at the pump shaft from the driving end.

6.2 The direction of rotation shall be clearly marked either by incorporating an arrow in the casing or by a separate metal arrow securely fitted to the pump.

7. Accessories — In addition to essential and optional accessories specified in IS : 5120-1977, provision shall be made for fitting the auxiliary piping as indicated below:

- a) Stuffing box sealing water connections shall be provided to the lantern rings,
- b) Impeller back vanes flushing arrangements shall be provided to the stuffing box (optional),
- c) The position of inspection hand holes with covers in suction and volute chamber of pump is optional, and
- d) Stuffing box cooling water connection shall be provided for pumps handling liquid above 95°C.

8. Suction Limitations

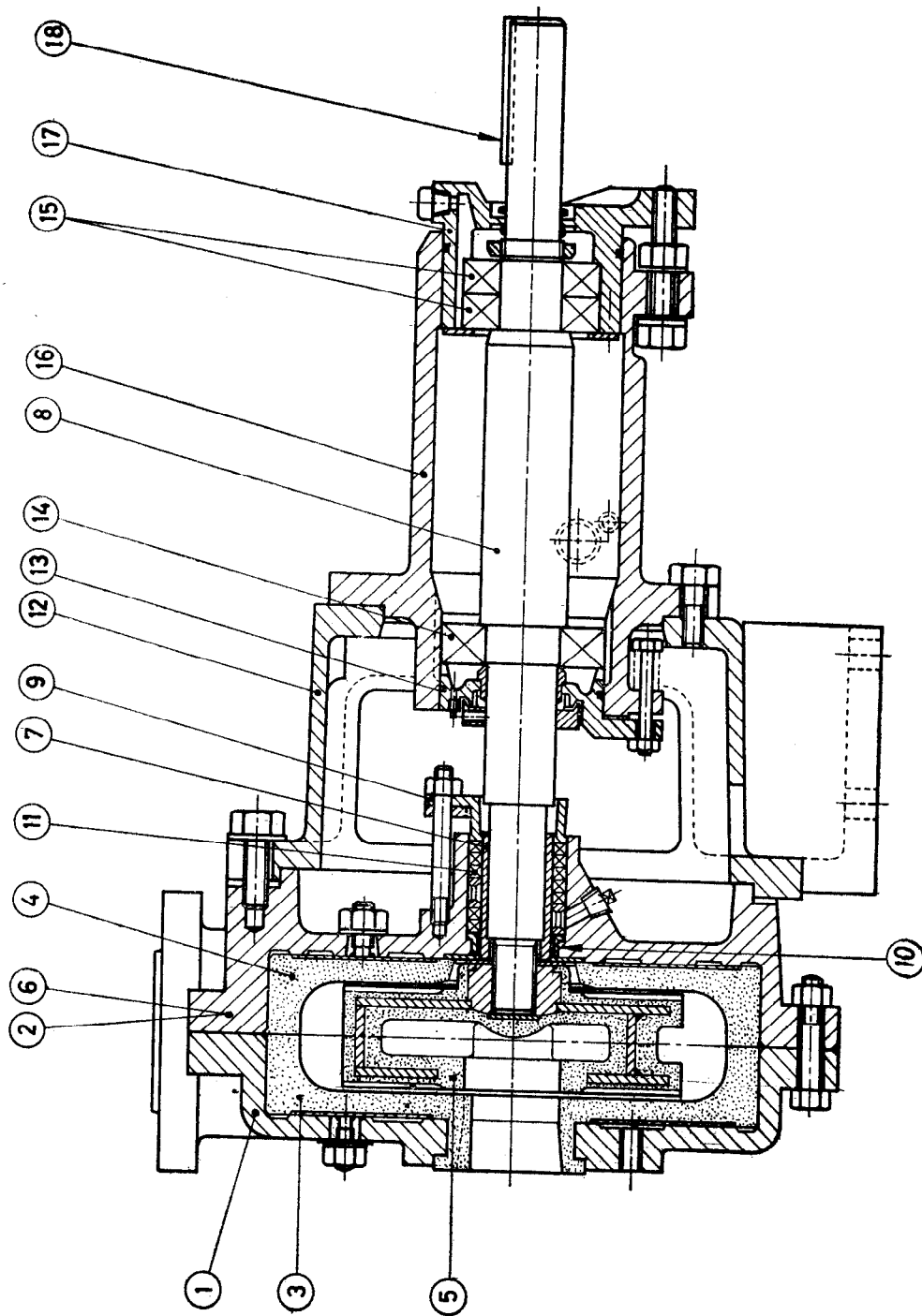
8.1 Among the more important factors affecting the operation of a centrifugal pump are the suction conditions. Abnormally high suction lifts beyond the suction rating of the pump usually cause considerable reductions in capacity, head and efficiency often leading to serious trouble, such as vibration and cavitation.

Adopted 28 August 1987

© August 1988, BIS

Gr 3

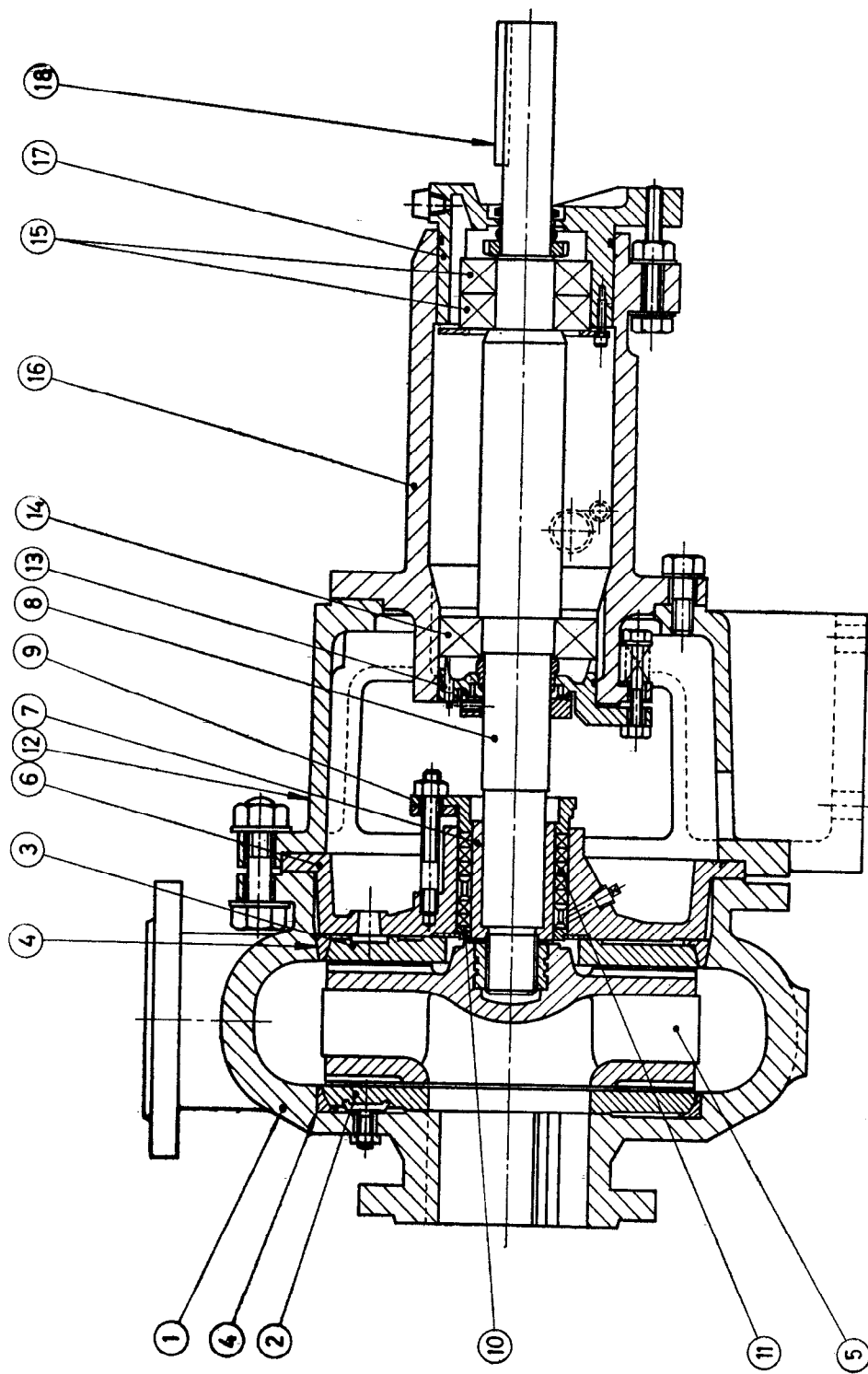
BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002



<i>S/ No.</i>	<i>Description</i>	<i>Materials</i>
1.	Suction cover	Cast iron grade minimum FG 200, IS : 210-1978 'Specification for grey iron castings (<i>third revision</i>)'/cast iron alloy/Ni-hard/steel alloy
2.	Casing	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy/Ni-hard/steel alloy
3.	Suction cover liner	Natural rubber/stainless steel alloy
4.	Gland side liner	Natural rubber/stainless steel alloy
5.	Impeller	Natural rubber/Ni-hard/steel alloy
6.	Stuffing box	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
7.	Shaft sleeve	Stainless steel alloy (300-600 BHN)
8.	Shaft	Stainless steel (minimum 12% Cr, IS : 6603-1972 Specification for stainless steel bars and flats)
9.	Gland	Stainless steel alloy/bronze
10.	Throat bush	PTFE
11.	Seal cage	PTFE
12.	Bearing bracket	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
13.	Oil seal housing	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
14.	Ball bearing	Standard quality
15.	Ball bearing	Standard quality
16.	Adapter	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
17.	Bearing housing	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
18.	Key for shaft	Stainless steel (minimum 12% Cr, IS : 6603-1972)

Note — The shape, material and arrangement of parts are for guidance only and are not intended to limit the design.

FIG. 1 SLURRY PUMP (WITH LINER)



<i>Sl No.</i>	<i>Description</i>	<i>Materials</i>
1.	Casing	Ni-hard (450 to 600 BHN)
2.	Suction wear plate (Optional)	Ni-hard (450 to 600 BHN)
3.	Gland side wear plate	Ni-hard (450 to 600 BHN)
4.	Wear plate seal ring	Rubber
5.	Impeller	Ni-hard (450 to 600 BHN)
6.	Stuffing box	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
7.	Shaft sleeve	Stainless steel alloy (300-600 BHN)
8.	Shaft	Stainless steel (minimum 12% Cr, IS : 6603-1972)
9.	Gland	Stainless steel alloy/bronze
10.	Throat bush	PTFE
11.	Seal cage	PTFE
12.	Bearing bracket	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
13.	Oil seal housing	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
14.	Ball bearing	Standard quality
15.	Ball bearing	Standard quality
16.	Adapter	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
17.	Bearing housing	Cast iron grade minimum FG 200, IS : 210-1978/cast iron alloy
18.	Key for shaft	Stainless steel (minimum 12% Cr, IS : 6603-1972)

Note — The shape, material and arrangement of parts are for guidance only and are not intended to limit the design.

FIG. 2 SLURRY PUMP (WITHOUT LINER)

8.2 Cavitation can be described as the condition existing in following liquids when the pressure at any point falls below the vapour pressure of the liquid at the prevailing temperature. Some of the liquid flashes into vapour and bubbles of the vapour are carried along with the liquid. If this happens in the suction area of a centrifugal pump or within the entrance of the impellers, the bubbles are carried into the impeller and undergo an increase in pressure and, therefore, condense and finally collapse.

8.2.1 Effects of cavitation — The effects of cavitation are:

- a) damage to material,
- b) cavitation noise,
- c) vibration due to the collapse of the bubbles, and
- d) deterioration in performance of the pump.

9. Factors Affecting Pump Performance — Factors affecting pump performance are the same as those specified in IS : 5659-1970 'Specification for pumps for process water'.

10. Design Features

10.1 The pumps may employ the hydroseal principle. The lining may be of natural rubber, neoprene rubber or other synthetic material depending upon the chemical and abrasive action of slurry.

10.2 The pumps may be made with enclosed chamber with wide passage to permit lower speed operation for reduced abrasive wear.

10.3 In case of semi-open, the rotating assembly shall be provided with wear adjustment at bearing frame to allow for impeller clearance due to wear.

10.4 The prime mover shall be of such a capacity as to provide under working site conditions, a power which is more than the maximum power required by the pump at any point in the operating range under site conditions, the difference being a minimum of 15 percent.

11. Information to be Supplied by the Purchaser and the Supplier — The information to be supplied by the purchaser and the supplier shall be the same as that specified in IS : 5120-1977.

12. Pump Tests

12.1 Pump testing arrangement shall be as specified in IS : 5120-1977.

12.1.1 The tolerances on performance shall be as given in IS : 5120-1977 or IS : 10981-1983 'Code of acceptance test for centrifugal mixed flow and axial pumps — Class B' as per agreement between the purchaser and the supplier.

12.2 The pump casing shall be of robust construction and tested to withstand a hydrostatic test pressure of 1.5 times the maximum discharge pressure. The test shall be carried out for 10 minutes.

12.3 During testing of the pump, the suction lift shall remain steady as declared by the manufacturer.

13. General Requirements — The general requirements for slurry pumps shall be as given in IS : 5120-1977.

14. Standard Marking — Details available with the Bureau of Indian Standards.

EXPLANATORY NOTE

The standard was first issued in 1979 and this revision has been taken up to include the following modifications in the standard:

- a) Revised sectional drawings have been included to indicate the nomenclature for pumps.
- b) A thorough change has been made in clause pertaining to pump tests.
- c) Requirement has been laid in regard to the suction lift of the pumps.